

CLAIMS

What Is Claimed Is:

- 1 1. A gyroscope comprising:
 - 2 a. a rotor mounted on a rotating shaft and having a circular flange
 - 3 on one surface thereof;
 - 4 b. a suspension member having a flexible flange concentric with
 - 5 and affixed to said rotating shaft and said rotor;
 - 6 c. a device for spinning said shaft and rotor;
 - 7 d. a light source disposed on a stationary plate for emitting light
 - 8 substantially perpendicular to a surface of said circular flange; and,
 - 9 e. a light sensor disposed on said stationary plate and on a side of
 - 10 said circular flange opposite of said light source for producing an electrical
 - 11 signal as a function of the amount of light received, said light source and said
 - 12 light sensor positioned such that the light received being representative of
 - 13 angular rotation rate being applied to said gyroscope.
- 1 2. The gyroscope as in Claim 1 wherein said circular flange on said one surface
- 2 of said rotor is one continuous circular band extending from and perpendicular to said
- 3 one surface of said rotor.
- 1 3. The gyroscope as in Claim 1 wherein said suspension member is formed from
- 2 one piece of metal.
- 1 4. The gyroscope as in Claim 1 wherein said flexible flange is adapted to allow
- 2 said rotor to tilt when an angular rotation rate is applied to said gyroscope.
- 1 5. The gyroscope as in Claim 1 wherein said electric drive motor for spinning
- 2 said shaft and rotor is a hysteresis synchronous motor.
- 1 6. The gyroscope as in Claim 1 wherein said light source disposed on a stationary
- 2 plate for emitting light perpendicular to a surface of said circular flange of said rotor is
- 3 at least one light emitting diode and one concomitant light sensor.

1 7. The gyroscope as in Claim 6 wherein said light source includes four light
2 emitting diodes and wherein each light emitting diode is in alignment with each of
3 said sensors.

1 8. The gyroscope as in Claim 1 wherein said rotor is formed from molded steel.

1 9. The gyroscope as in Claim 1 wherein said rotor is machined from steel.

1 10. A gyroscope including an electric motor for spinning a shaft having mounted
2 thereon a rotor, said gyroscope comprising:

3 a. said rotor having a circular flange extending from and
4 perpendicular to one surface thereof;

5 b. a suspension member having a flexible flange concentric with
6 and affixed to said rotor;

7 c. a light source disposed on a stationary plate for emitting light
8 perpendicular to a surface of said circular flange of said rotor; and,

9 d. a light sensor also disposed on said stationary plate and on a
10 side of said circular flange opposite of said light source for producing an
11 electrical signal as a function of the amount of light received, said light source
12 and said light sensor positioned such that only a portion of the light from said
13 source strikes said sensor when said gyro is in a quiescent rotating state.

1 11. The gyroscope as in Claim 10 wherein said flexible flange is adapted to allow
2 said rotor to tilt when an angular force is applied to said gyroscope.

1 12. The gyroscope as in Claim 10 wherein said light source disposed on a
2 stationary plate for emitting light perpendicular to a surface of said circular flange of
3 said rotor is at least one light emitting diode for each pickoff axis.

1 13. The gyroscope as in Claim 10 wherein said light source includes four light
2 emitting diodes wherein each light emitting diode is in alignment with each of said
3 sensors.

1 14. The gyroscope as in Claim 10 wherein the flexible flange of said suspension
2 member is suspended from the body of said member at only two points on the
3 periphery thereof whereby said suspension member is free to bend in two directions.

1 15. The gyroscope as in Claim 10 wherein a direct current is produced by said
2 sensors when said gyroscope is operation without any angular force applied thereto.

1 16. The gyroscope as in Claim 10 wherein a sinusoidal waveform is produced in
2 response to an angular force applied to said gyroscope.

1 17. An improved gyroscope including an electric motor for spinning a shaft
2 having mounted thereon a rotor, said gyroscope comprising:

3 said rotor having a circular flange extending from and perpendicular to
4 one surface thereof and having a notch therein;

5 a suspension member having a flexible flange concentric with and
6 affixed to said rotor;

7 a light source disposed on a stationary plate for emitting light
8 perpendicular to a surface of said circular flange of said rotor; and,

9 a light sensor also disposed on said stationary plate and on a side of said
10 circular flange opposite of said light source for producing an electrical signal as
11 a function of the amount of light received, said light source and said light
12 sensor positioned such that only a portion of the light from said source strikes
13 said sensor when said gyro is in a quiescent rotating state; and,

14 said light sensor also producing a reference frequency signal in response
15 to light from said light source passing through said notch in said circular flange
16 during each revolution thereof.

1 18. The gyroscope as in Claim 17 further including a demodulator for
2 demodulating said electrical signal.

1 19. The gyroscope as in Claim 18 wherein said reference frequency signal is used
2 in synchronizing operation of said demodulator.

- 1 20. The gyroscope as in Claim 17 wherein said suspension member flexible flange
- 2 is adapted to allow said rotor to tilt when an angular force is applied to said
- 3 gyroscope.

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20